

THAT WHICH IS CLAIMED IS:

1. A portable electronic device, comprising:
a housing;
5 first and second spaced apart transducers positioned in the housing; and
a multi-mode audio processor circuit configured to transmit sound from the
first transducer in a first mode of operation and to generate a composite audio signal
from sound energy received by the first and second transducers in a second mode of
operation.
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2. The device of Claim 1 wherein the multi-mode audio processor circuit
is configured to generate an audio signal from sound energy received by the second
transducer in the first mode of operation.
- 15 3. The device of Claim 1 wherein the multi-mode audio processor circuit
is further configured to combine first and second audio signals produced from sound
energy received by the first and second transducers, respectively, in the second mode
of operation to generate a noise-attenuated audio signal.
4. The device of Claim 1 further comprising:
an audio amplifier configured to be coupled to the first transducer in the first
mode of operation; and
a preamplifier configured to be coupled to the first transducer in the second
mode of operation.
5. The device of Claim 4, further comprising a switch coupled to the first
transducer and configured to isolate a path of the audio amplifier from a path of the
preamplifier during the first and second modes of operation, the switch being
configured to be in a first position coupled between the first transducer and the audio
amplifier in the first mode of operation and to be in a second position coupled
between the first transducer and the preamplifier in the second mode of operation.

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6. A mobile terminal comprising:
a housing;
a microphone positioned in the housing;
a speaker positioned in the housing remote from the microphone; and
a multi-mode audio processor circuit configured to apply noise cancellation to first and second microphone inputs thereof, the first microphone input being coupled to the microphone and the second microphone input being coupled to the speaker.

7. The mobile terminal of Claim 6 wherein the speaker comprises a transducer and wherein the multi-mode audio processor circuit is configured to transmit sound from the transducer in a first mode of operation and to generate a composite audio signal from sound energy received by the microphone and the transducer in a second mode of operation.

8. The mobile terminal of Claim 7 wherein the multi-mode audio processor circuit is configured to generate an audio signal from sound energy received by the microphone in the first mode of operation.

9. The mobile terminal of Claim 7 wherein the multi-mode audio processor circuit is further configured to combine first and second audio signals produced from sound energy received by the microphone and the transducer, respectively, in the second mode to generate a noise-attenuated audio signal.

10. The mobile terminal of Claim 7 further comprising:
an audio amplifier configured to be coupled to the transducer in the first mode of operation; and
a preamplifier configured to be coupled to the transducer in the second mode of operation.

11. The mobile terminal of Claim 10, further comprising a switch coupled to the first transducer and configured to isolate a path of the audio amplifier from a path of the preamplifier during the first and second modes of operation, the switch being configured to be in a first position coupled between the first transducer and the

audio amplifier in the first mode of operation and to be in a second position coupled between the first transducer and the preamplifier in the second mode of operation.

12. A mobile terminal comprising a multi-mode audio processor circuit operatively associated with a transducer, the multi-mode audio processor circuit being configured to operate the transducer as a speaker during a first mode of operation and a microphone during a second mode of operation.

13. The mobile terminal of Claim 12 wherein the transducer comprises a first transducer, the mobile terminal further comprising:

a housing, the first transducer being positioned in the housing; and

5 a second transducer positioned in the housing and spaced apart from the first transducers, wherein the multi-mode audio processor circuit is further configured to transmit sound from the first transducer in a first mode of operation and to generate a composite audio signal from sound energy received by the first and second transducers in a second mode of operation.

10 14. The mobile terminal of Claim 13 wherein the multi-mode audio processor circuit is configured to generate an audio signal from sound energy received by the second transducer in the first mode of operation.

15 15. The mobile terminal of Claim 13 wherein the multi-mode audio processor circuit is further configured to combine first and second audio signals produced from sound energy received by the first and second transducers, respectively, in the second mode to generate a noise-attenuated audio signal.

16. The mobile terminal of Claim 13 further comprising:
an audio amplifier configured to be coupled to the first transducer in the first mode of operation; and
a preamplifier configured to be coupled to the first transducer in the second mode of operation.

17. The mobile terminal of Claim 16, further comprising a switch coupled to the first transducer and configured to isolate a path of the audio amplifier from a

path of the preamplifier during the first and second modes of operation, the switch being configured to be in a first position coupled between the first transducer and the audio amplifier in the first mode of operation and to be in a second position coupled between the first transducer and the preamplifier in the second mode of operation.

18. A method of operating a mobile terminal, comprising:
transmitting sound from a first transducer in a first mode of operation; and
generating a composite audio signal from sound energy received by the first transducer and a second transducer in a second mode of operation.

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19. A method according to Claim 18, further comprising:
operating the mobile terminal in the first mode of operation when
the mobile terminal is idle or receiving a call; and
operating the mobile terminal in the second mode of operation when the
10 mobile terminal is on a call.

20. A method according to Claim 18, further comprising:
operating the mobile terminal in the first mode of operation when the mobile terminal is idle or receiving a call;
15 operating the mobile terminal in the first mode of operation when the mobile terminal is on a call when voice activity has not been detected;
operating the mobile terminal in the second mode of operation when the mobile terminal is on a call when voice activity has been detected.

20 21. The method of Claim 18 wherein transmitting sound from first transducer is preceded by:
receiving a call request at the mobile terminal from a base station, wherein
transmitting sound from a first transducer comprises alerting a user of the mobile terminal of the call request using the first transducer as a speaker in the first mode of
25 operation.

22. The method of Claim 21 further comprising:
determining if the call request has been accepted at the mobile terminal; and
switching the mobile terminal from the first mode of operation to the second
mode of operation if the call has been accepted at the mobile terminal.

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23. The device of Claim 22 wherein generating a composite signal further
comprises:

combining the first and second audio signals produced from sound energy
received by the first and second transducers, respectively, in the second mode of
operation; and

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generating a noise-attenuated audio signal based on the combination of the
first and second audio signals.

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